User Manual

CLOCKWORK V2
DELAY

Chapter 1 - OVERVIEW

In this second rendition, we've completely overhauled the original design of the pedal to come up with a unique concept that packs a whole lot of useful features and sound possibilities, whilst retaining the compact footprint. New features include presets capability, 6 new variation modes, and stereo inputs / outputs. The overall delay algorithms have also been redesigned and improved.

Clockwork Delay V2 offers ***standard delay*** mode plus six ***variation*** modes. The variation modes includes ***Tape***, ***Lo-Fi***, ***Ambient***, and ***Multi-Head (Multi-Tap) delays***.

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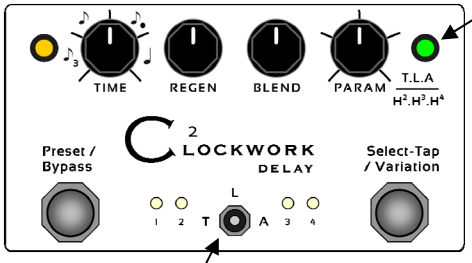
Important - must read

The table below lists all available modes with their respective 'PARAM' knob functions.

		MODES	PARAM
		Standard	*Modulation*
Primary Variations	[T]	Tape	*Resonance*
	[L]	Lo-Fi	*Modulation*
	[A]	Ambient	*Pitch-Shift*
Secondary Variations	[H^2]	Multi-Head (2-heads)	*Heads Matrix*
	[H^3]	Multi-Head (3-heads)	*Heads Matrix*
	[H^4]	Multi-Head (4-heads)	*Heads Matrix*



Variation LED

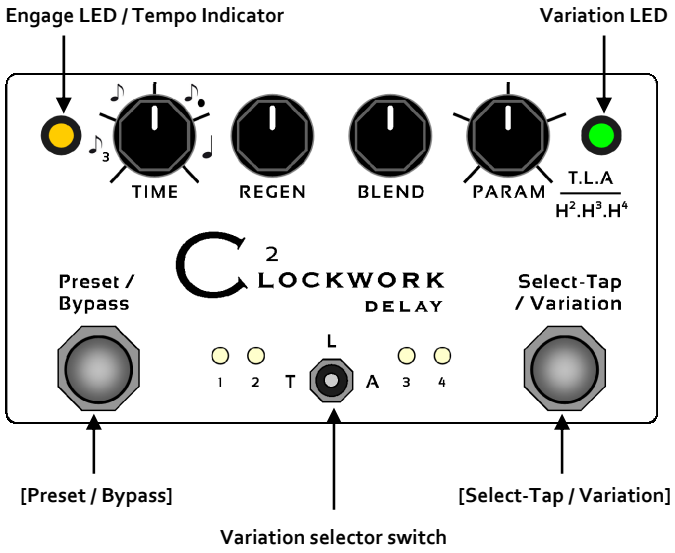
- **Off : Standard delay mode.**
- **Green : Primary variation set (*Tape, Lo-Fi, Ambient*)**
- **Red : Secondary variation set (*H2, H3, H4*)**

Use this selector switch to choose between *Tape, Lo-Fi*, and *Ambient* (when you're in primary set) or between H^2, H^3, and H^4 (when you're in secondary set)

See chapter 2 for details.

Chapter 2 - Operation

All features and operations of the pedal are accessible through the 2 footswitches. Operation of the footswitches have been carefully designed to keep things as simple and intuitive as possible.



Switching between Standard and Variation modes (T.L.A / H^2.H^3.H^4)

1. Press both footswitches simultaneously.

Don't worry about doing this while playing live, the state of variation can be stored in presets. Position of the Variation selector switch determines which mode gets activated (this information is also stored in presets).

Saving a preset

1. Press [Select-Tap / Variation] to select the desired preset location.
2. Press and hold [Preset / Bypass] until the Engage LED flashes.

Loading a preset

1. Press [Select-Tap / Variation] to select the desired preset location.
2. Press [Preset / Bypass] to load the selected preset.

Presets are selected by going through each location in the 'Up' direction (1, 2, 3, …), while going trough these steps the sound does not get updated until selection is confirmed by pressing [Preset / Bypass].

Bypassing or Engaging the pedal

1. Press [Preset / Bypass].

When the pedal is in bypassed state, the tempo indicator (orange LED) is off.

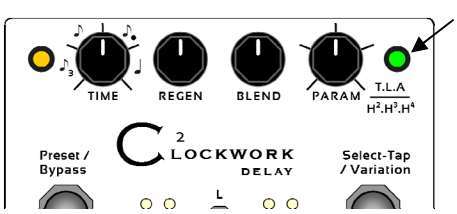
Switching between primary and secondary Variation Set

Primary set : **T . L . A** - *Tape, Lo-Fi, Ambient*

Secondary set : **H2 . H3 . H4** - *2-heads, 3-heads, 4-heads (Multi-Head / Multi-Tap delay)*

Only one set can be activated at a given time.
To go back and forth between the two variation sets do the following :

1. Press and hold both footswitches until the Variation LED changes its color and flashes 3x.



Variation LED

- **Off : Standard delay mode.**
- **Green : Primary variation set (*Tape*, *Lo-Fi*, *Ambient*)**
- **Red : Secondary variation set (*H2*, *H3*, *H4*)**

Each variation set has its own preset space : so you have 4 available presets when using the primary variation set, and another 4 presets when using the secondary variation set.

T . L . A	**H^2 . H^3 . H^4**
Preset 1	Preset 1
Preset 2	Preset 2
Preset 3	Preset 3
Preset 4	Preset 4

For example, you can have preset arrangement like this :

	T . L . A	**H^2 . H^3 . H^4**
Preset location 1 -	Standard (slow mod)	H^2 (pattern I)
Preset location 2 -	Standard (medium mod)	Standard
Preset location 3 -	Tape	H^3 (pattern I)
Preset location 4 -	Lo-Fi	H^4 (pattern II)

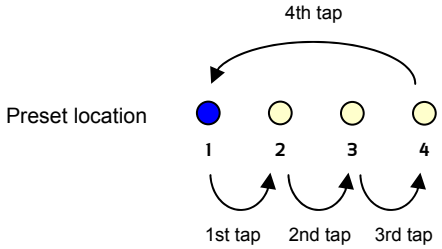
Let's say the current sound is **Standard (slow modulaton)**, to switch to the **H_4 (pattern II)** sound do the following :

1. Switch to Secondary variation set.
2. Select preset location 4.
3. Confirm the selection.

Chapter 3 - Tap Tempo Function

The delay time can be set in relation to the tempo of the music by tapping on the [Select-Tap / Variation] footswitch. Recall that the same footswitch is also used to select preset locations, so how can we engage tap-tempo function without inadvertently making preset selection?

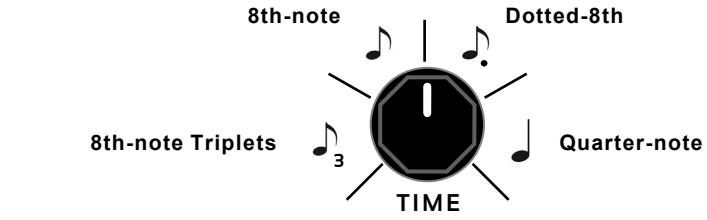
Note that whichever preset location you're currently on, it takes a maximum of 3 moves to get to any other preset locations. Let's say you're on *preset location 1*, then it takes 3 footswitch taps to get into *preset location 4*. Tapping the footswitch one more time will take you back to where you started (the current preset location).

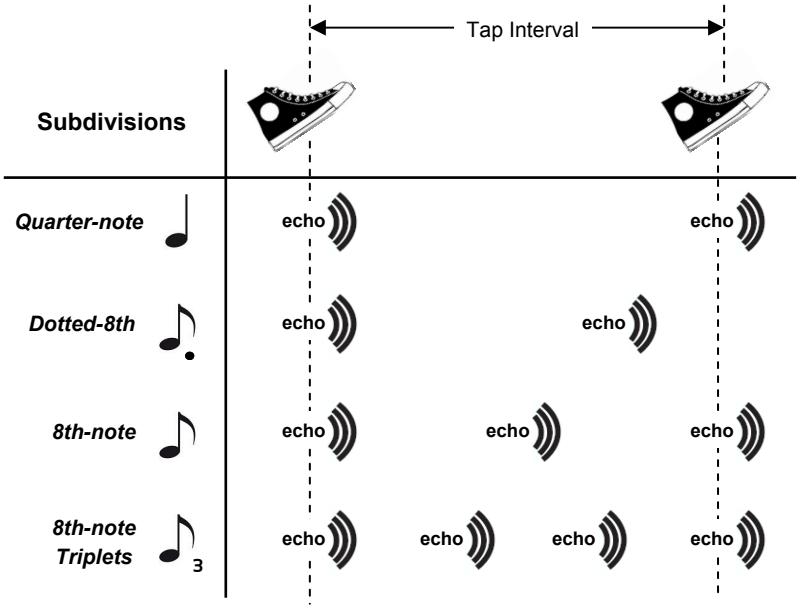


With this consideration in mind, we've programmed the pedal so that the tap-tempo function is engaged if more than 3 footswitch taps is registered. In other words, **you must tap at least 4x to initiate the tap-tempo function**. The new delay time will be updated immediately after the 4th tap.

Subdivision (tap-ratio)
When using the tap-tempo function, you can use the TIME knob to select one of the four subdivision options. The TIME knob is partitioned into 4 region, where each region represents a subdivision.

* Note that the subdivision setting is only relevant when using the tap-tempo function.





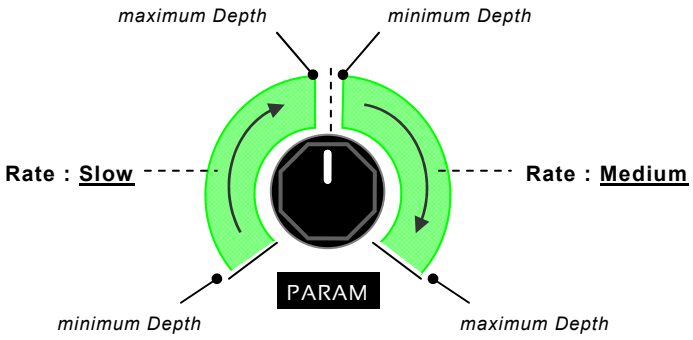
Tips : Select “Quarter-note” if you want the echo interval to match the tap interval.
Select “8th-note” if you want the echo interval to be half the tap interval.

Chapter 4 - The Algorithms

Standard

This is a pristine digital delay with modulation. A touch of tone-shaping is applied to keep the repeats from being 'sterile cold', while retaining clarity and definition. Maximum delay time is 1000 ms (1 second).

PARAM knob is partitioned into 2 regions : the first half constitutes *slow* modulation rate and the second half constitutes *medium* rate. The modulation *Depth* is fully adjustable within each region (modulation depth increases as the knob is turned clockwise). Thus you have modulation with adjustable depth and a choice if two different rates.

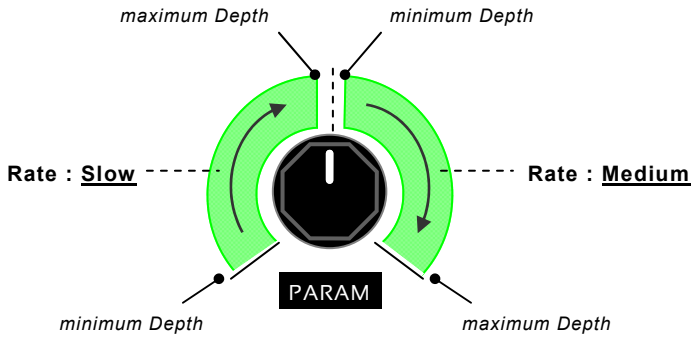


The Algorithms

Lo-Fi

This variation mode has a special voicing that mimics that of an analog delay. The warm and lush repeats work great to thicken your guitar sound without getting in the way of the dry sound. Maximum delay time is 1000 ms (1 second).

PARAM knob is partitioned into 2 regions : the first half constitutes *slow* modulation rate and the second half constitutes *medium* rate. The modulation *Depth* is fully adjustable within each region (modulation depth increases as the knob is turned clockwise). Thus you have modulation with adjustable depth and a choice if two different rates.



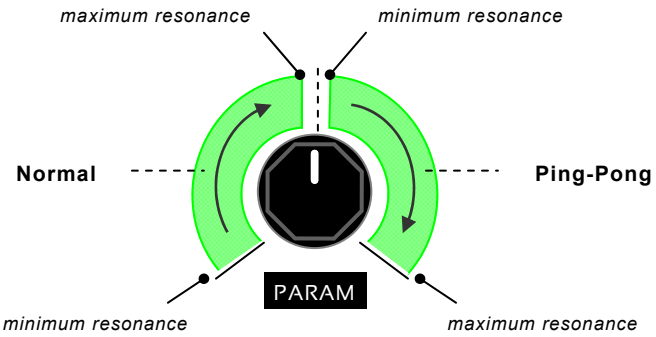
The Algorithms

Tape

This mode is an emulation of the tape echo system that produces band-limited echoes with a touch of saturation and delay time variation.

PARAM knob is partitioned into 2 regions : the first half constitutes *normal stereo* and the second half constitutes *ping-pong stereo*. Feedback resonance is fully adjustable within each region (resonance increases as the knob is turned clock-wise).

** Stereo setup is required to hear the effect of ping-pong configuration*.

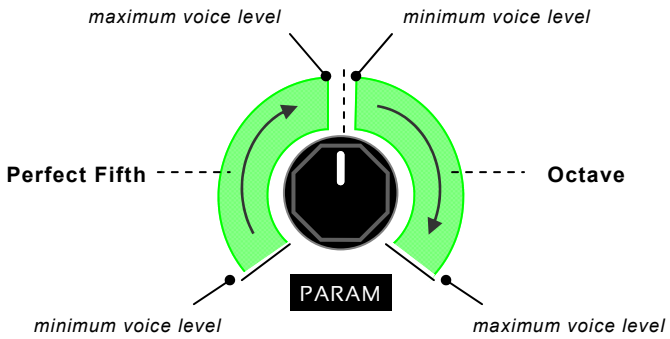


The Algorithms

Ambient

This variation mode blurs the line between delay and reverb. Repeats get more diffuse with each iteration, and as REGEN knob is turned up the echoes wash out into reverb-like ambience.

PARAM knob controls the *type* and *level* of a secondary pitch-shifted voice. The first half of the knob range constitutes *Perfect-fifth* pitch interval and the second half constitutes *Octave* interval. The voice level is adjustable within each region (loudness increases as the knob is turned clockwise).



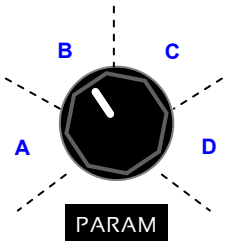
Finally, the repeats bounce between the two output channels (ping-pong), resulting in a very wide stereo impression. As such, this mode works best in stereo setup.

To summarize, this variation mode is about reverb-like ambience + pitch-shifted voices + stereo rhythmic groove. There are lots of wonderful sound textures to be discovered.

The Algorithms

H^2 (2-heads delay)

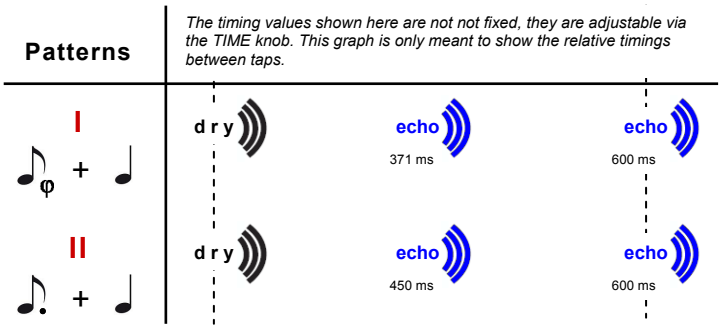
This is a model of tape delay with 2 “playback heads”. Each input sound event will be played back twice at different delay times, and signals from the playback heads are re-injected into the feedback loop, creating layers of warm and complex multi-tap echoes. 2 choices of heads matrix configurations (tap patterns) are accessible through the PARAM knob.



Head Configuration (tap patterns)

- A : Pattern I - normal
- B : ping-pong
- C : Pattern II - normal
- D : ping-pong

** As the REGEN knob is turned up higher, a touch of reverb-like ambience starts to appear*



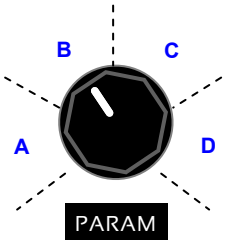
* denotes “golden ratio” interval.

denotes “dotted-eigth” interval.

The Algorithms

H^3 (3-heads delay)

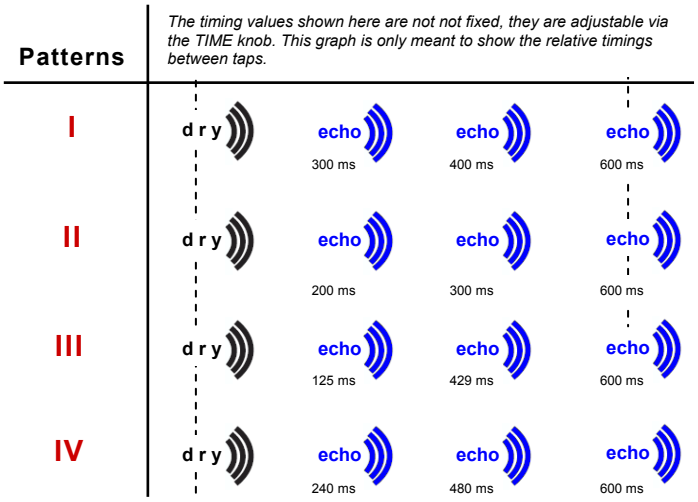
This is a model of tape delay with 3 “playback heads”. Each input sound event will be played back thrice at different delay times, and signals from the playback heads are re-injected into the feedback loop, creating layers of warm and complex multi-tap echoes. 4 choices of heads matrix configurations (tap patterns) are accessible through the PARAM knob.



Heads Matrix configuration (tap patterns)

- A : **Pattern I**
- B : **Pattern II**
- C : **Pattern III**
- D : **Pattern IV**

** As the REGEN knob is turned up higher, a touch of reverb-like ambience starts to appear, and the stereo spread of the echoes increases.*

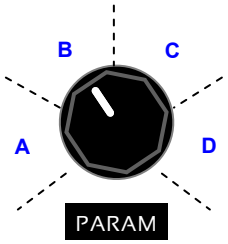


The Algorithms

H^4 (4-heads delay)

This is a model of tape delay with 4 “playback heads”.

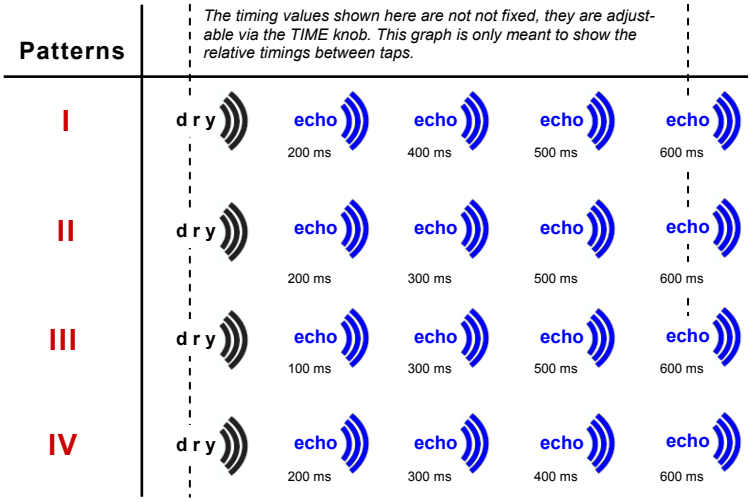
4 choices of head configurations (tap patterns) are accessible through the PARAM knob.



Heads Matrix configuration (tap patterns)

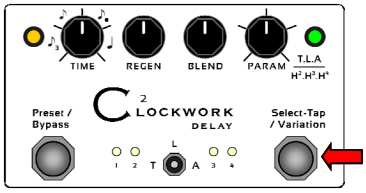
- **A : Pattern I**
- **B : Pattern II**
- **C : Pattern III**
- **D : Pattern IV**

** As the REGEN knob is turned up higher, a touch of reverb-like ambience starts to appear, and the stereo spread of the echoes increases.*



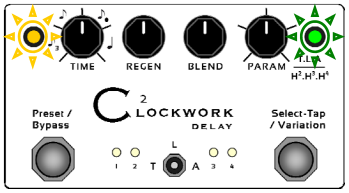
Chapter 5 - Auto Regen Sweep

When you activate this feature the pedal automatically sweeps the *Regeneration* parameter to the maximum value, hold it there, and sweeps it back to the previously set value - It's like having someone turns the REGEN knob while you're playing. Used judiciously, this feature introduces useful dynamic elements to the delay texture.



Press and hold [Select-Tap / Variation].

The *Regeneration* parameter gradually sweeps to maximum value (as if someone slowly turns the Regen knob all the way up).



As long as you hold the footswitch down, the *Regen* parameter stays at its maximum value and both LEDs keep on flashing.

When you finally release the footswitch, the *Regen* parameter slowly sweeps back to the previously set value.

Features :

- Precision and versatile delay in a compact pedal.
- Fully programmable (4 x 2 presets).
- Normal delay + 6 variation modes.
- Tap-Tempo (with 4 subdivision option).
- Stereo input and output.
- 24-bits signal processing.
- Analog Dry-thru.
- Delay trails persistence.

Specifications :

- Input impedance : 1 MOhm.
- Output impedance : 500 Ohm.
- Current consumption : ~ 100 mA.
- Weight : 0.6 Kg (1.2 lbs).
- Dimension : 12 (L) x 6.5 (W) x 3.6 (H) cm
- Powered by an external 9V DC Adaptor (sold separately).

This product is designed and manufactured by :

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GFI System
Jakarta, Indonesia.